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DERWENT-WEEK: 200231

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TITLE: Foldable portable communication terminal e.g.
mobile telephone includes light emitting diodes which
are arranged to hinge sections, such that diodes
are visible in antenna protruding direction during closed
condition

PATENT-ASSIGNEE: SONY CORP[SONY]

PRIORITY-DATA: 2000JP-0247203 (August 17, 2000)

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ABSTRACTED-PUB-NO: JP2002064599A

BASIC-ABSTRACT:

NOVELTY - Several light emitting diodes are arranged to the hinged sections (16,18,20,22,24,26) such that the diodes are visible from a direction where an antenna (6) is protruded, during closed condition of the communication terminal.

USE - Foldable portable communication terminal e.g. mobile radio telephone.

ADVANTAGE - The optical display section of portable communication terminal is viewed from various directions effectively and reliably.

DESCRIPTION OF DRAWING(S) - The figure shows the portable communication terminal in open condition.

Antenna 6

Hinged sections 16,18,20,22,24,26 ✓

CHOSEN-DRAWING: Dwg.1/6

DERWENT-CLASS: W01

EPI-CODES: W01-C01A3; W01-C01D1A;

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Derwent Accession Number - NRAN (1):
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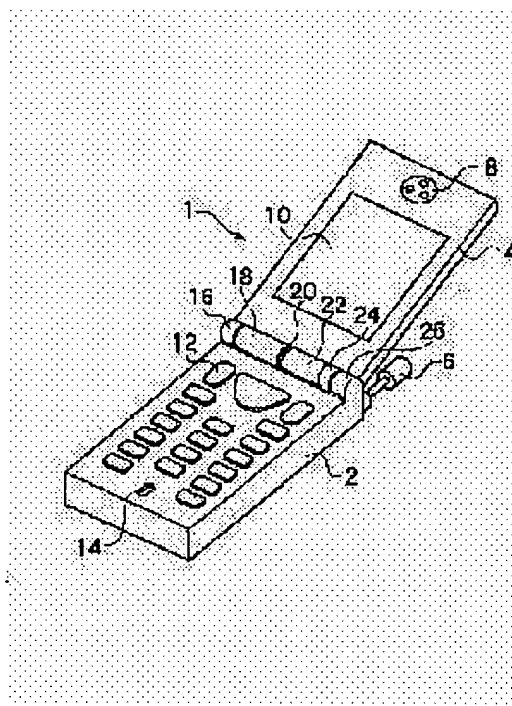
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(54) FOLDABLE MOBILE COMMUNICATION TERMINAL

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a foldable mobile communication terminal that allows a user to be able to see an optical display section in various directions at all times independently of the opening/closing of a cover.

SOLUTION: The foldable mobile communication terminal has a 1st case 2, a 2nd case 4 and a hinge section 16-26 that engages with the 1st case and the 2nd case in an opening/closing enabled way, and an antenna 6 placed on the hinge section side of the 1st case 2. The hinge is provided with a phosphor that is lighted in response to a prescribed operation of the foldable mobile communication terminal, seen by a user in both the opening/closing states of the foldable mobile communication terminal, and seen at least in a projection direction of the antenna in the closing state.



LEGAL STATUS

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CLAIMS

[Claim(s)]

[Claim 1] In the fold-up formula pocket communication terminal which has the hinge region engaged possible [closing motion of a case, the 2nd case, and said the 1st case and said 2nd case] and by which the projecting antenna was formed in said hinge region side of said 1st case [1st] While emitting light according to predetermined actuation of said fold-up formula pocket communication terminal and being visible in closing motion both the condition of said pocket communication terminal, in a closed state The fold-up formula pocket communication terminal characterized by having the emitter arranged by said hinge region so that it might be visible also from the direction where said antenna projects at least.

[Claim 2] Said illuminant is a fold-up formula pocket communication terminal according to claim 1 characterized by being the same configuration as the configuration of said hinge region.

[Claim 3] Said emitter is a fold-up formula pocket communication terminal according to claim 1 characterized by being a piece of a light guide.

[Claim 4] Said emitter is a fold-up formula pocket communication terminal according to claim 3 characterized by supplying light to the end of said emitter from the light emitting device which was connected to said 1st case and attached in the interior of this 1st case.

[Claim 5] Said emitter is a fold-up formula pocket communication terminal according to claim 3 characterized by supplying light to the end of said emitter from the light emitting device which was connected to said 2nd case and attached in the interior of this 2nd case.

[Claim 6] Said emitter is a fold-up formula pocket communication terminal according to claim 3 characterized by supplying light from the light emitting device embedded at the end.

[Claim 7] Said emitter is a fold-up formula pocket communication terminal according to claim 1 characterized by being a light emitting device.

[Claim 8] Said illuminant is a fold-up formula pocket communication terminal according to claim 1 to 6 characterized by being arranged in the center of said hinge region.

[Claim 9] Said emitter is a fold-up formula pocket communication terminal according to claim 1 characterized by changing a lighting pattern according to predetermined actuation of said fold-up formula pocket communication terminal.

[Claim 10] Said lighting pattern is a fold-up formula pocket communication terminal according to claim 8 characterized by being change or the flashing period of a color which emits light.

[Claim 11] Said predetermined actuation is a fold-up formula pocket communication terminal according to claim 1 to 10 characterized by including the time [exhausting / cell] at the time of contents data download at the time of e-mail arrival at the time of telephone arrival.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the pocket communication terminal by which the antenna was especially attached in the hinge region side for folding of a body (the 1st case) about a foldable pocket communication terminal.

[0002]

[Description of the Prior Art] Although the need of a pocket communication terminal is increasing explosively, it folds up also in it, and it can miniaturize at the time of un-using it, and since there is an advantage that portability improves, a formula pocket communication terminal is in the inclination which the number of users increases. In the pocket communication terminal by which the antenna was projected and attached in the hinge region side for folding of a body, when a lid (the 2nd case) is shut, or when a lid is opened, it is necessary for an optical display to be able to be seen from the outside. When it is necessary to tell a user about the signal of arrival of the mail when closing a lid and putting into the pocket and the lid is opened, it is necessary to tell a user about for example, E-mail reception or consumption of a cell.

[0003] Conventionally, there was a pocket communication terminal by which an antenna is projected and attached in the far-end section of a lid far from the folding hinge region side of a pocket communication terminal, and the optical display is attached in the far-end section side of the lid. Moreover, the pocket communication terminal by which the optical display which consisted of small LED was attached in the hinge region side for folding is also indicated.

[0004]

[Problem(s) to be Solved by the Invention] However, since the antenna was located up when the optical display of a pocket communication terminal was attached in the far edge side of a lid and a pocket communication terminal was put into a pocket where the lid is folded up, the optical display came to the pocket bottom, and the optical display changed into the condition of not being visible to a user, and had the problem that an arrival-of-the-mail display was not in sight.

[0005] moreover -- since an optical display cannot be seen and seen under the effect of a lid if the optical display which consisted of small LED is attached in a hinge region, and a lid is opened and closed -- an optical display -- right and left of a lower case -- it could not but attach to one of hinge fixed parts. In such a pocket communication terminal, it was difficult not to be concerned with closing motion of a lid but for a user to always look at the optical display from various directions.

[0006] This invention was made in view of the above-mentioned technical problem, the place made into the purpose is not concerned with closing motion of a lid, but the pocket communication terminal as which a user can always regard the optical display from various directions is offered.

[0007] Moreover, the purpose of this invention offers the pocket communication terminal which can change a lighting pattern for every mode of operation.

[0008]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, it has the hinge region

engaged possible [closing motion of a case, the 2nd case, and the 1st case and 2nd case]. [1st] While a projecting antenna emits light according to predetermined actuation of a fold-up formula pocket communication terminal and appears in closing motion both the condition of a pocket communication terminal in the fold-up formula pocket communication terminal prepared in the hinge region side of the 1st case It consists of closed states so that it may have the emitter arranged by the hinge region so that it might be visible also from the direction where the antenna projects at least.

[0009] Preferably, the illuminant of this invention is the same configuration as the configuration of a hinge region, and consists of pieces of a light guide. Moreover, the emitter is constituted so that light may be supplied to the end of an emitter from the light emitting device which was attached in the 1st or 2nd case, and was attached in the interior of the 1st or 2nd case, respectively.

[0010] Moreover, the emitter of this invention is constituted so that light may be supplied from the light emitting device embedded to the end or both ends of the piece of a light guide. Furthermore, the emitter can also consist of light emitting devices which emit light by itself.

[0011] Moreover, this illuminant is constituted so that it may attach in the central part of a hinge region.

[0012] This emitter is constituted so that a lighting pattern may be changed according to predetermined actuation of a fold-up formula pocket communication terminal. There is a pattern, such as changing the luminescent color of an emitter and changing the flashing period of an emitter, among the lighting patterns. This predetermined mode of operation contains the mode corresponding to the time [exhausting / cell] etc. at the time of contents download at the time of e-mail arrival at the time of telephone arrival.

[0013]

[Embodiment of the Invention] Gestalt 1. drawing 1 of operation is drawing which looked at the condition of having opened the lid of the pocket communication terminal of the gestalt of 1 operation of this invention, from slant. In drawing 1, the pocket communication terminal 1 consists of a lower case (body) 2 and an up case (lid) 4. The lower case 2 contains an antenna 6, the input section 12, a microphone 14, the 1st hinge fixed part 16, the optical display 20, the hinge covering 22, and the 2nd hinge fixed part 26. The up case 4 includes the receiver section 8, a display 10, the 1st hinge moving part 18, and the 2nd hinge moving part 24.

[0014] The structure of the fold-up formula pocket communication terminal of this invention is explained briefly. In drawing 1, since there are not the conventional pocket communication terminal and a difference except optical display 20, explanation of parts other than optical display 20 is omitted here. Since the optical display 20 of this invention is formed in the almost same curvilinear configuration as the peripheral shape of the hinge covering 22, the optical display 20 is detectable from a quite wide range direction. This structure is explained in full detail in drawing 2.

[0015] Drawing 2 is drawing which looked at the condition when removing the up case (lid) 4 from a body from slant in the pocket communication terminal of the gestalt of 1 operation of this invention. In drawing 2, the same part as drawing 1 gives the same sign, and omits the explanation. As shown in drawing 2, the 1st hinge moving part 18 and the 2nd hinge moving part 24 which were established in the end of the up case 4 are engaged between the hinge fixed part 16 and the 2nd hinge fixed part 26 which were prepared in the end of the lower case 2, and the fold-up formula pocket communication terminal of this invention has structure which the up case 4 can open and close to the lower case 2. The hinge covering 22 is a part which only covers the space along which the flexible substrate and code for carrying out the interface of between the up case 4 and the lower case 2 electrically pass, and is not the part which participates in engagement of the up case 4 and the lower case 2 directly.

[0016] When the 1st hinge moving part 18 and the 2nd hinge moving part 24 are made to engage with the 1st hinge fixed part 16 and the 2nd hinge fixed part 26, respectively so that it may be illustrated, the optical display 20 of this invention is formed so that it may become the almost same horseshoe shape configuration as the configuration of the hinge covering 22. When the optical display 20 can be seen [of the lower case 2] from a transverse plane (field in which the input section 12 was attached) when the up case 4 is open, and the up case 4 closes by this, the optical display 20 can be seen [of the lower case 2] from a top face (field in which the antenna was attached). Of course, the optical display 20 can be seen

from across also except these fields.

[0017] In addition, the optical display 20 can arrange not only one but plurality horizontally, and can also divide and use each for the object for arrival of the mail, the object for e-mail reception, the object for EMD download, and the notice of a cell residue. Moreover, the color of the optical display 20 can be changed and it can respond to the object for arrival of the mail, the object for e-mail reception, EMD or the object for download of contents data, and the notice of a cell residue. Furthermore, it can also be made to correspond by changing the flashing period of the optical display 20 to the object for arrival of the mail, the object for e-mail reception, the object for EMD download, and the notice of a cell residue.

[0018] Drawing 3 is drawing which looked at the condition of having closed the lid of the pocket communication terminal of the gestalt of 1 operation of this invention, from slant. In drawing 3, the same part as drawing 1 gives the same sign, and omits the explanation. The optical display 20 of this invention is formed in the almost same curvilinear configuration as the peripheral shape of the hinge covering 22 in drawing 3. Therefore, even when the up case 4 is closed, the optical display 20 can be detected from quite wide range directions, such as a transverse plane of a pocket communication terminal, a top face, and the direction of slant.

[0019] Drawing 4 is the end view showing the installation condition of an optical display in a detail in the pocket communication terminal of the gestalt of 1 operation of this invention. In drawing 4, the same part as drawing 1 gives the same sign, and omits the explanation. In drawing 4, the lower case 2 has the substrate 30 built into that interior, LED32 attached in a part of this substrate 30, and the optical display 20. The light which emitted light by this LED32 is supplied from the end A of the optical display 20, and the optical display 20 shines and is visible from End A before the other end B. The other end B of the optical display 20 is fixed to the supporter material 34. This End A and other end B are suitably determined according to the configuration of the hinge region of a pocket communication terminal. Although there is a method of scattering the light which attached the crack to the inside of the optical display 20, and was supplied from End A in the part of the crack, or the approach of manufacturing the optical display 20 with the ingredient containing the dispersion matter in order to brighten the optical display 20, especially the approach is not limited.

[0020] Moreover, although the configuration of the optical display 20 is formed in the almost same configuration as the peripheral shape of the hinge covering 22 in drawing 4, it is not necessary to necessarily keep step with the same height as the periphery front face of the hinge covering 22, and the front face of the optical display 20 may jump out rather than the periphery front face of the hinge covering 22, and the reverse is sufficient as the front face of the optical display 20.

[0021] Moreover, although LED32 is formed on a substrate 30 and the light from the LED32 is supplied to the end A of the optical display 20 in drawing 4, LED32 may be attached or embedded at the end A of the optical display 20, and may supply power to the LED32 by the electric power supply line from a substrate 30 without attaching on a substrate 30. In addition, although the optical display 20 is illustrated in drawing 4 as supported by the supporter material 34, the optical display 20 may be supported to the lower case 2 in parts other than supporter material 34 or substrate 30.

[0022] Furthermore, LED32 may be attached in the other end B of the optical display 20, although LED32 is illustrated in drawing 4 so that it may attach in the end A of the optical display 20. In this case, the end A of the optical display 20 may be supported with a substrate 30, and may be supported in other supporter material which is not illustrated or parts other than substrate 30. With such structure, the direction near the other end B of the optical display 20 can be brightened brightly.

[0023] Moreover, you may make it attach or embed LED32 to the both ends A and B of the optical display 20. In this case, the optical display 20 will be supported in parts other than supporter material 34 or substrate 30.

[0024] since the optical display 20 is attached in the hinge structure of the gestalt 1 of operation between the hinge covering 22 which are the boiled-fish-paste-like components attached in the body (lower case 2) side of a hinge region, and the 1st hinge moving part 18 -- the optical display 20 -- a case -- it is constituted so that it may be mostly located at the core.

[0025] Moreover, in the hinge structure of the gestalt 1 of operation, since the antenna is arranged at the

hinge region side of the lower case 2, when a pocket communication terminal is put into a chest pocket etc., the optical display 20 appears in the upper limit of a chest pocket, and a user can check this optical display 20 certainly.

[0026] Moreover, since the optical display 20 of the gestalt 1 of operation is formed in the almost same configuration as the peripheral shape of the hinge covering 22, where a lid (up case 4) is shut, it can see the optical display 20 from a transverse-plane [of a pocket communication terminal], or top-face side, and where a lid is opened, it can see the optical display 20 from the transverse-plane side of a pocket communication terminal.

[0027] Moreover, it switches on the light or blinks by different color from the time of telephone arrival, and the optical display 20 can be widely developed for the application which notifies a receive state and a cell residue, when it awaits not only in the notice of telephone arrival in the pocket communication terminal of the structure of the gestalt 1 of operation, for example and there is e-mail reception in the condition, or when a cell residue decreases.

[0028] Moreover, since the optical display 20 of the gestalt 1 of operation is formed in the almost same curvilinear configuration as the peripheral shape of the boiled-fish-paste-like hinge covering 22 instead of the point light source unlike the conventional thing, it can also change the strength of light according to the distance from the LED light source.

[0029] Gestalt 2. drawing 5 of operation is drawing which looked at the condition when removing a lid (up case 4) from a body from slant in the pocket communication terminal of the gestalt 2 of operation of this invention. In the gestalt 2 of operation, it is constituted so that the optical display 20 may be attached in the up case 4. The configuration of the optical display is formed in the almost same curvilinear configuration as the peripheral shape of the 1st hinge moving part 18 or the 2nd hinge moving part 24 in the optical display 20 of the gestalt 2 of operation. With the gestalt 2 of operation, like the gestalt 1 of operation, it cannot be concerned with closing motion of the up case 4, but the optical display 20 can be seen from various directions by such configuration.

[0030] Drawing 6 is drawing showing the physical relationship of the optical display 20 and LED32. Drawing 6 (a) is drawing showing the structure which attaches the optical display 20 at the tip of the up case 4, attaches or embeds LED32 at the end of the optical display 20, and supplies power to the LED32 through the electric power supply line 36. Such structure has the description which can attach the optical display 20 in the up case 4, even when the thickness of the up case 4 is thin.

[0031] Drawing 6 (b) is drawing showing the structure which attaches the optical display 20 at the tip of the up case 4, attaches or embeds LED32 to the both ends of the optical display 20, respectively, and supplies power to each of such LED32 through each electric power supply line 36. In such structure, since two LED32 is attached in the optical display 20, the optical display 20 whole can shine more brightly.

[0032] Drawing 6 (c) is drawing showing the structure which attaches the optical display 20 at the tip of the up case 4, attaches LED32 in the center section of that optical display 20, and supplies power to this LED32 through the electric power supply line 36. In such structure, since the light from LED32 is supplied from the center of the optical display 20, the center section of the optical display 20 can shine more brightly.

[0033] Drawing 6 (d) is drawing showing the structure which attaches the optical display 20 at the tip of the up case 4, forms the optical feed zone 38 in the middle of that optical display 20, attaches LED32 in that optical feed zone 38, and supplies power to this LED32 through the electric power supply line 36. In such structure, since LED32 is attached in the point of the arbitration of the optical display 20, it can design so that the part of the arbitration of the optical display 20 may shine more brightly.

[0034] Drawing 6 (e) is drawing showing the structure which puts LED32 supported with the supporter 40 which attached the optical display 20 at the tip of the up case 4, and was attached in the substrate 42 in the up case 4 on the interior of that optical display 20, and supplies power to this LED32 through the electric power supply line 36. In such structure, the light of LED32 is supplied to the optical display 20 through space, and the optical display 20 diffuses the light from LED32, and can shine.

[0035] Drawing 6 (f) is drawing showing the structure which attaches the optical display 20 at the tip of

the up case 4, and supplies power to the optical display 20 through the electric power supply line 36.

The optical display 20 can reduce the stroke which attaches LED in the optical display 20 by not supplying light from LED but considering as the light emitting device with which the optical display 20 whole shines. Moreover, it can set to such an optical display 20, and the pattern of brightness of the optical display 20 whole, for example, the luminescent spot on the optical display 20, can be arranged the shape of a dotted line, in the shape of an alternate long and short dash line, etc.

[0036] In addition, in the gestalt 2 of operation, although the optical display 20 shown in drawing 6 (a) - drawing 6 (f) is displayed to attach in the up case 4, it can be attached in the lower case 2 stated with the gestalt 1 of operation.

[0037]

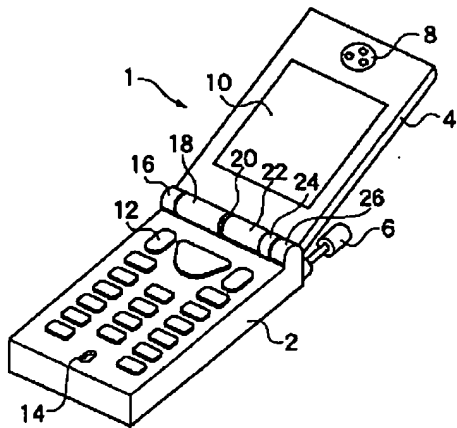
[Effect of the Invention] As explained above, according to this invention, it cannot be concerned with closing motion of a lid, but a user can see the optical display of the pocket communication terminal from various directions.

[0038] Moreover, according to this invention, since an optical display can be put on the central part of a hinge region, an optical display can be arranged in a very conspicuous location.

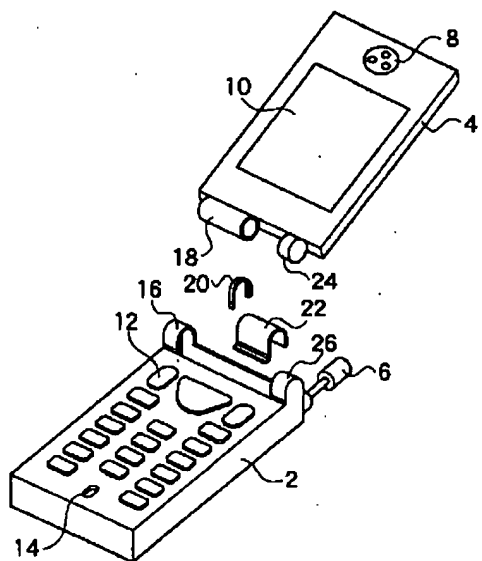
[0039] Moreover, according to this invention, the color and/or lighting pattern of an optical display are changeable for every mode of operation.

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Drawing selection

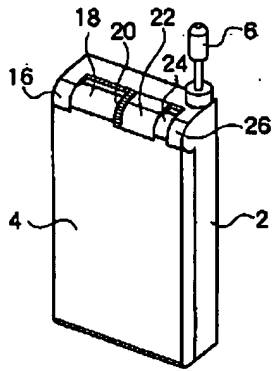


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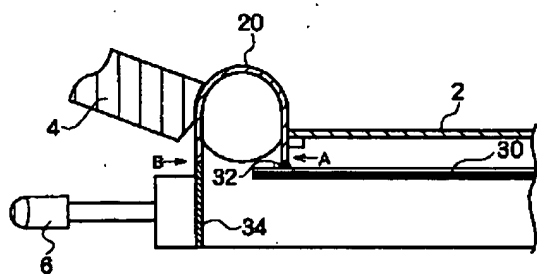
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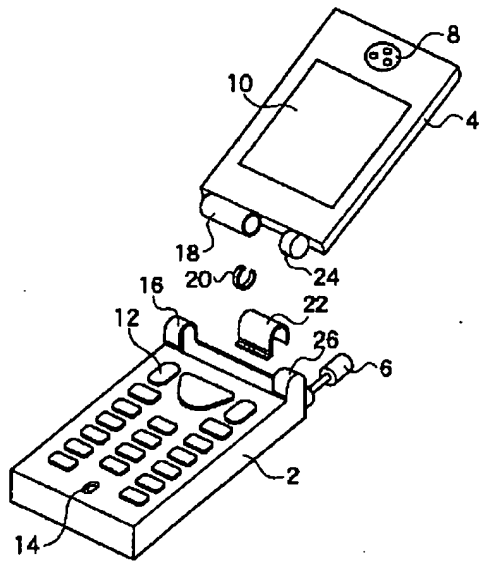


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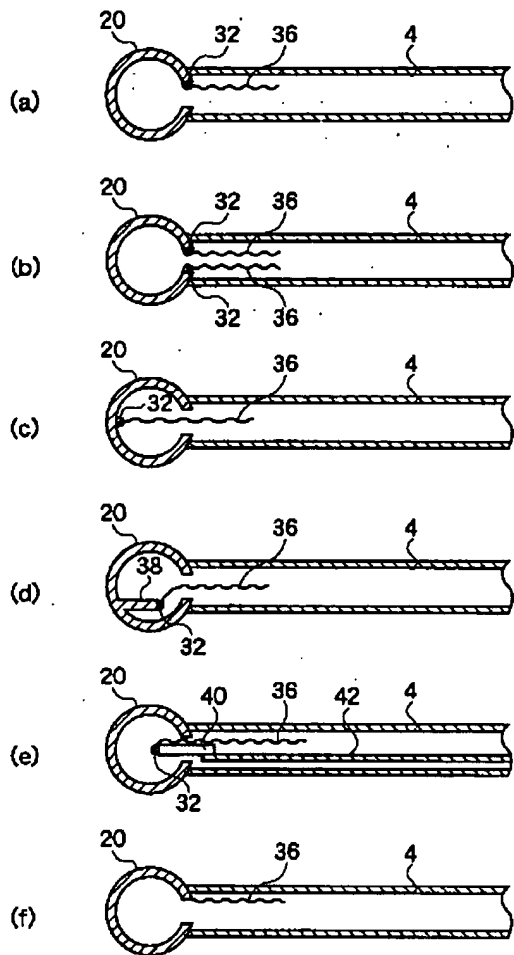
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